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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/805,814	03/22/2004	Michael J. Brosnan	10040348-1	9966
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Kathy Manke Avago Technologies Limited 4380 Ziegler Road Fort Collins, CO 80525			EXAMINER TRAN, MY CHAU T	
			ART UNIT	PAPER NUMBER
			2629	
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			07/24/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/805,814

Applicant(s)

BROSNAN ET AL.

Examiner

MY-CHAU T. TRAN

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 June 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,4-6,18,19 and 21-31 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) 21,22 and 29-31 is/are allowed.
- 6) ☒ Claim(s) 1,2,18,19 and 25-28 is/are rejected.
- 7) ☐ Claim(s) 4-6 and 24 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date See Office Action.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- ☐ Notice of Informal Patent Application
- ☐ Other: _____.

DETAILED ACTION

Application and Claims Status

1. Applicant's amendment and response filed 06/07/2007 are acknowledged and entered.
2. Claims 1-20 were pending. Applicants have amended claims 1; cancelled claims 3, 7-17, and 20; and added claims 21-31. Therefore, claims 1, 2, 4-6, 18, 19, and 21-31 are currently pending and are under consideration in this Office Action.

Information Disclosure Statement

3. The information disclosure statements (IDS) filed on 04/16/2007, 06/14/2007, and 07/05/2007 have been reviewed, and the references that have been considered are initialed as recorded in PTO-1449 forms.

Terminal Disclaimer

4. The terminal disclaimer filed on 06/07/2007 disclaiming the terminal portion of any patent granted on this application, which would extend beyond the expiration date of any patent granted on Application Number 10/795,688 has been reviewed and is accepted. The terminal disclaimer has been recorded.

Status of Claim(s) Objection(s) and /or Rejection(s)

5. The objection of the disclosure in regard to the first paragraph wherein applicant refers to the U.S. patent applications by their Attorney Docket Number has been withdrawn in light of applicant's amendments of the disclosure.

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6. The rejection of claims 1, 2, and 11-17 under 35 USC 102(b) as being anticipated by Piot et al. (US Patent 6,256,016 B1) has been withdrawn in light of applicant's amendments of claim 1 and cancellation of claims 3 and 7-17.

7. The rejection of claim 20 under 35 USC 102(b) as being anticipated by Walley (US Patent 6,770,863 B2) has been withdrawn in light of applicant's cancellation of claim 20.

8. The provisional rejection under the judicially created doctrine of obviousness-type double patenting of claims 1-3, 18, and 19 over claims 1-3 and 20 of copending Application No. 10/795,688 has been withdrawn in view of the terminal disclaimer filed on 06/07/2007.

9. Additionally, upon further reconsideration of claim 18 in view of Piot et al. (US Patent 6,256,016 B1) and amended claim 1 and in view of Kakarala et al. (Patent Application Publication US2004/0051798 A1; submitted in IDS filed 06/14/2007) new grounds of rejections are made. Accordingly, this Office Action is a Non-Final Office Action and the Office apologizes for any inconvenience.

New Rejection(s)

Claim Rejections - 35 USC § 102

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

11. Claims 18 and 19 are rejected under 35 U.S.C. 102(b) as being anticipated by Piot et al. (US Patent 6,256,016 B1).

For **claim 18**, Piot et al. disclose an optical detecting system and method that detects movement of the optical detecting system (see e.g. Abstract; col. 4, lines 5-21; col. 4, line 43 thru col. 5, line 4). The method comprises the steps of a) illuminating an imaging surface with an at least partially coherent light source, thereby generating reflected images; b) generating digital images based on the reflected images; and c) generating movement data based on the digital images, wherein the movement data is generated based on movement calculations that have a low sensitivity to image effects caused by particle contamination (see e.g. col. 4, line 58 thru col. 5, line 4; col. 5, line 18-40; col. 10, lines 21-27 and 57-66; col. 13, line 54 thru col. 14, line 63; fig. 7(a)).

For **claim 19**, Piot et al. disclose that the light source is a laser diode (see e.g. col. 4, lines 9-12).

Therefore, the method of Piot et al. does anticipate the instant claimed invention.

12. Claims 23 and 25-28 are rejected under 35 U.S.C. 102(b) as being anticipated by Piot et al. (US Patent 6,256,016 B1).

For **claims 23 and 25-28**, Piot et al. disclose an optical detecting system and method that detects movement of the optical detecting system (see e.g. Abstract; col. 4, lines 5-21; col. 4, line 43 thru col. 5, line 4; col. 5, line 18-40). The apparatus comprises a coherent light source that is a laser diode (refers to instant claimed light source) wherein the light source illuminates an

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imaging surface and generates reflected images, and photosensor array that generates image data signals from the reflected images to be use for an image motion detection calculation (refers to instant claimed navigation sensor)(see e.g. col. 4, lines 5-42; col. 4, line 43 thru col. 5, line 4; col. 6, line 66 thru col. 7, line 46; col. 8, line 22 thru col. 11, line 54; col. 11, line 66 thru col. 12, line 14; figs. 2, 3, and 4B-4D). The calculation uses a cross-correlation analysis that calculates the image data signals in the y-direction (refers to instant claimed columns of pixels) and the x-direction (refers to instant claimed rows of pixels)(see e.g. col. 4, line 43 thru col. 5, line 4; col. 5, line 18-40; col. 13, line 54 thru col. 14, line 63; fig. 7(a)). The calculation uses the formula of $\sum_x \sum_y f(x, y)g(x-m, y-n)$ wherein the variables $\sum_x \sum_y$ imply that the image data signals in the y-direction and the x-direction are summed, i.e. calculation include summing pixels values (see e.g. col. 14, lines 48-63). Additionally, Piot et al. disclose that the image data signals include a pixel clock signal, which suggest that the correlation analysis include temporal differences (see e.g. col. 14, lines 6-19).

Therefore, the device of Piot et al. does anticipate the instant claimed invention.

Response to Arguments

13. Applicant's arguments directed to the above 102(b) rejection were considered but they are not persuasive for the following reasons.

[1] Applicant contends that the device of Piot et al. does not anticipate the instant claimed invention because Piot et al. does not teach or suggest the limitation of '*summing pixels values from a first one of the digital images, thereby generating a first plurality of sums, summing pixel values from a second one of the digital images, thereby generating a second plurality of sums,*' as recited in the new independent claim 25', which was claimed in cancelled claim 11.

This is not found persuasive for the following reasons:

[1] The examiner respectfully disagrees. It is the examiner's position that Piot et al. does suggest the functional limitation of *"summing pixels values from a first one of the digital images, thereby generating a first plurality of sums, summing pixel values from a second one of the digital images, thereby generating a second plurality of sums," as recited in the new independent claim 25'*, which was claimed in cancelled claim 11. Piot et al. disclose that the calculation uses the formula of $\sum_x \sum_y f(x, y)g(x-m, y-n)$ wherein the variables $\sum_x \sum_y$ imply that the image data signals in the y-direction and the x-direction are summed, i.e. calculation include summing pixels values. Accordingly, Piot et al. does suggest the functional limitation of *"summing pixels values from a first one of the digital images, thereby generating a first plurality of sums, summing pixel values from a second one of the digital images, thereby generating a second plurality of sums," as recited in the new independent claim 25'*, which was claimed in cancelled claim 11.

Therefore, the teachings of Piot et al. do anticipate the apparatus of the instant claims, and the rejection is maintained.

Claim Rejections - 35 USC § 103

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

15. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

16. Claims 1 and 2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Piot et al. (US Patent 6,256,016 B1) in view of Kakarala et al. (Patent Application Publication US2004/0051798 A1; *submitted in IDS filed 06/14/2007*).

For **claims 1 and 2**, Piot et al. disclose an optical detecting system and method that detects movement of the optical detecting system (see e.g. Abstract; col. 4, lines 5-21; col. 4, line 43 thru col. 5, line 4; col. 5, line 18-40). The apparatus comprises a coherent light source that is a laser diode (refers to instant claimed light source and instant claim 2) The apparatus comprises a coherent light source that is a laser diode (refers to instant claimed light source) wherein the light source illuminates an imaging surface and generates reflected images, and photosensor array that generates image data signals from the reflected images to be use for an image motion detection calculation (refers to instant claimed navigation sensor)(see e.g. col. 4, lines 5-42; col. 4, line 43 thru col. 5, line 4; col. 6, line 66 thru col. 7, line 46; col. 8, line 22 thru col. 11, line 54; col. 11, line 66 thru col. 12, line 14; figs. 2, 3, and 4B-4D). The calculation uses a cross-correlation analysis that calculates the image data signals in the y-direction (refers to instant claimed columns of pixels) and the x-direction (refers to instant claimed rows of pixels)(see e.g.

col. 4, line 43 thru col. 5, line 4; col. 5, line 18-40; col. 13, line 54 thru col. 14, line 63; fig. 7(a)). The calculation uses the formula of $\sum_x \sum_y f(x, y)g(x-m, y-n)$ wherein the variables $\sum_x \sum_y$ imply that the image data signals in the y-direction and the x-direction are summed, i.e. calculation include summing pixels values (see e.g. col. 14, lines 48-63). Additionally, Piot et al. disclose that the image data signals include a pixel clock signal, which suggest that the correlation analysis include temporal differences (see e.g. col. 14, lines 6-19). Although Piot et al. do not specifically disclose that image data include a set of active pixels and a set of spare pixel, it is art recognized that image data include a set of active pixels and a set of spare pixel as evidence by Victor et al. (US Patent 4,920,260; see e.g. col. 6, lines 10-16).

The teachings of Piot et al. differs from the presently claimed invention as follows:

For **claim 1**, Piot et al. fail to disclose that the navigation sensor is configured to detect defective pixels in the digital images.

However, Kakarala et al. teach the limitations that are deficient in Piot et al. as follows:

For **claim 1**, Kakarala et al. disclose a digital image system and a method for detecting and correcting defective pixels in a digital image sensor (see e.g. Abstract; section: [0010], [0026], and [0029]). The digital image system comprises a sensor that provides pixels values that are stored in a buffer, and a digital processor that applies the algorithm for detecting and correcting defective pixels in a digital image sensor (see e.g. section: [0026], and [0029]; fig. 1). Additionally, Kakarala et al. disclose that the digital image system can be a computer system with a memory for storing image data (see e.g. section: [0010]).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to disclose that the navigation sensor is configured to detect defective pixels

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in the digital images as taught by Kakarala et al. in the device of Piot et al. One of ordinary skill in the art would have been motivated to disclose that the navigation sensor is configured to detect defective pixels in the digital images in the device of Piot et al. for the advantage of providing an efficient and accurate bad pixel correction algorithm that requires minimal memory and computation (Kakarala: section [0009]). Additionally, both Piot et al. and Kakarala et al. disclose that the image data signals are stored for further processing (Piot: col. 4, lines 32-42; Kakarala: section [0026]). Furthermore, one of ordinary skill in the art would have a reasonable expectation of success in the combination of Piot et al. and Kakarala et al. because Kakarala et al. disclose that the digital image system can be a computer system with a memory for storing image data (see e.g. section: [0010]).

Therefore, the combine teachings of Piot et al. and Kakarala et al. do render the apparatus of the instant claims *prima facie* obvious.

Allowable Subject Matter

17. Claims 4-6 and 24 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

18. Claims 21, 22, and 29-31 allowed.

Conclusion

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to MY-CHAU T. TRAN whose telephone number is 571-272-0810. The examiner can normally be reached on Monday: 8:00-2:30; Tuesday-Thursday: 7:30-5:00; Friday: 8:00-3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard A. Hjerpe can be reached on 571-272-7691. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/My-Chau T. Tran/
Patent Examiner
Art Unit 2629
July 20, 2007

 7/20/07
MY-CHAU T. TRAN
PATENT EXAMINER